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What benefits do community forests provide, and to whom? A rapid assessment of ecosystem services from a Himalayan forest, Nepal

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ABSTRACT

In Nepal, community forestry is part of a national strategy for livelihoods improvement and environmental protection. However, analysis of the social, economic and environmental impacts of community forestry is often limited, restricted to a narrow set of benefits (e.g. non-timber forest products) and rarely makes comparisons with alternative land-use options (e.g. agriculture). This study, conducted at Phulchoki Mountain Forest Important Bird and Biodiversity Area (IBA) in the Kathmandu Valley, used methods from the Toolkit for Ecosystem Service Site-based Assessment (TESSA) to compare multiple ecosystem service values (including carbon storage, greenhouse gas sequestration, water provision, water quality, harvested wild goods, cultivated goods and nature-based recreation) provided by the site in its current state and a plausible alternative state in which community forestry had not been implemented. We found that outcomes from community forestry have been favourable for most stakeholders, at most scales, for most services and for important biodiversity at the site. However, not all ecosystem services can be maximised simultaneously, and impacts of land-use decisions on service beneficiaries appear to differ according to socio-economic factors. The policy implications of our findings are discussed in the context of proposals to designate Phulchoki Mountain Forest IBA as part of a Conservation Area.

1. Introduction

Against a backdrop of global loss and degradation of forest (Food and Agriculture Organisation of the United Nations, 2010), more effective approaches to forest management are required. In an effort to address this there has been a gradual trend towards more devolved forms of forest governance (Agrawal et al., 2008), with Nepal being one of the first countries to decentralise many aspects of forest management to local communities. Over the last 30 years, community forestry in Nepal has developed to form part of a strategy for livelihoods improvement and environmental protection. The Forest Act, 1993, provided forest-dependent communities, through local-level institutions (Community Forest User Groups, CFUGs) with legal rights over forest management. By 2009, community forests covered 25% of Nepal's forested area with almost 14,500 CFUGs (Ojha et al., 2009) most of whom are members of the Federation of Community Forestry Users, Nepal (FECOFUN). Evidence suggests that community management can lead to a marked increase in forest cover and a positive effect on biodiversity in general (Acharya, 2003).

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Forests are widely recognised as providing benefits not just for the conservation of nature but also for human well-being (Myers, 1997). These benefits, referred to as ecosystem services, are realised at a range of scales, including local-level forest products, regional-level watershed services and global benefits from global climate change mitigation through carbon storage and greenhouse gas sequestration. However, at the local level it is often the case that benefits and costs are not equitably distributed. In Nepal, despite improved forest management and environmental conditions since the introduction of community forests (Baland et al., 2010; Chhetri et al., 2012), some studies suggest that the poorest and the most marginalised members of communities, including women, may receive the least benefit (Keshav and Varughese, 2000; Malla et al., 2003; Adhikari, 2005; Ojha et al., 2009).

The purpose of the study was to assess how designation of part of Phulchoki Mountain Forest Important Bird and Biodiversity Area (referred to as 'Phulchoki IBA' hereafter) as a community forest has affected the provision of a range of ecosystem services for different groups of beneficiaries by comparing the benefits received from the site under different land uses – the first approach of its kind in Nepal. We applied a newly developed toolkit (TESSA: Toolkit for Ecosystem Services Site-based Assessment; URL: http://www.birdlife.org/datazone/info/estoolkit) to measure the ecosystem services at Phulchoki IBA. To be relevant at the site scale, methods for quantifying services need to collect data relevant to decisions affecting the site (Peh et al., 2013). A number of tools and methods have been developed in recent years that can be used to assess, quantify and value ecosystem services such as: Integrated Valuation of Environmental Services and Tradeoffs (InVEST; Kareiva et al., 2011); ARtifical Intelligence for Ecosystem Services (ARIES; Villa et al., 2009); Social Values for Ecosystem Services (SolVES; Sherrouse et al. 2014); Multi-scale Integrated Models of Ecosystem Services (MIMES: http://www.afordablefutures.com/services/mimes). However, none of these enable site-scale data collection of high resolution without the need for specialist technical knowledge, long-term or highly detailed data collection or substantial costs. TESSA enables relatively rapid and inexpensive assessments by non-experts of the magnitude, monetary values (where appropriate) and distribution of ecosystem services delivered by sites, resulting in an understanding of the consequences of potential changes in land management on ecosystem service provision and consideration of the equity implications of decisions – key to achieving any social development goals – that are often overlooked in other assessments (Pagiola et al., 2005; Corbera et al., 2007a, 2007b). Hence TESSA was the most appropriate method to use in this study because it suited the capacity of the national NGO (Bird Conservation Nepal, BCN) implementing the work. BCN has a developing understanding of the ecosystem services approach and significant connections through to local and national policy making. The results will be used to inform local and national decision-makers in relation to the current government proposal to designate Phulchoki IBA as part of a wider Conservation Area.

2. Material and methods

2.1. Study area

Phulchoki Mountain (2800 m asl), lying 16 km southeast of Kathmandu, is the highest peak on the rim of the Kathmandu Valley. The area experiences a short intensive rainy season (between June and September) and a relatively long dry season during the rest of the year. This climate supports four main vegetation types: *Schima-Castanopsis* forest; *Pinus roxburghii* forest; *Alnus nepalensis* forest; and *Quercus*-dominated forest. The area is recognised by Bird Conservation Nepal (BCN, BirdLife International's Partner in Nepal) as an IBA – one of 27 such sites in the country), on account of its importance for the restricted-range bird species, Spiny Babbler *Turdoides nipalensis* (Nepal's only endemic breeding bird) and Hoary throated Barwing *Actinodura nipalensis*, and significant populations of species characteristic of the Sino-Himalayan Temperate Forest biome (Baral and Inskipp, 2005; BirdLife International, 2013). Other species of significance include the Golden Emperor butterfly *Dilipa morgiana*, Leopard *Panthera pardus* and many threatened orchids. Phulchoki IBA covers 4281 ha, one third of which is managed as community forests (1368 ha), and the rest (mainly on and around the summit) is national (state) forest. Nineteen CFUGs manage land inside the IBA boundary with almost 3000 household members. Phulchoki IBA is part of a larger forest complex covering the Phulchoki-Chandragiri part of the mid-hills biogeographic zone (Fig. 1).

Most people living around the forest are dependent on subsistence farming for their livelihoods. In lowland areas rice cultivation predominates, followed either by a second crop of rice, or by wheat, potato, maize or mustard. Livestock (mainly cows, buffaloes and goats) play an essential role in the agricultural system. Past forest degradation through over-grazing, uncontrolled use of fire and over-harvesting of forest products occurred under District Forest Office management. At Phulchoki, forest cover was reduced

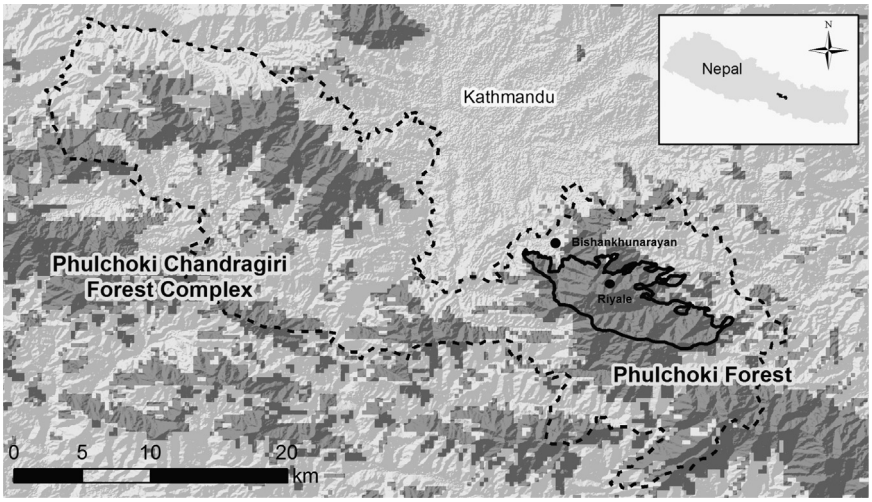

Fig. 1. Study site. Location of Phulchoki Mountain Forest IBA (inset black boundary) and the Phulchoki-Chandragiri Forest Complex (dotted boundary), Nepal. Forested areas are depicted in dark grey.